Common Core 7+

Applications of Proportions

Mr. Herman

Standard 7.RP.1

Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.

Standard 7.RP.2

Recognize and represent proportional relationships between quantities.
a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. Represent proportional relationships by equations.
c. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.

Standard 7.RP.3

Use proportional relationships to solve multistep ratio and percent problems.

Standard 7.G.1

Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

Standard 8.EE.5

Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.

Standard 8.EE.6

Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane. Derive the equation $y=mx$ for a line through the origin and $y=mx+b$ for a line intercepting the vertical axis at b.

This packet belongs to ____

SWBAT: ____

Standard 7.RP.1 *Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.*

A _________________ is a comparison of two *similar items*. There are an infinite number of these.

Example:

- Teachers and Students=People
- Apples and Oranges= Fruit
- Cats and Dogs=Animals

When you compare two **similar items** you will have **no units** when you are finished.

There are 3 ways to write a ratio:

- Using the word **to**
- Using a colon (**:**)
- Writing a fraction (**always reduce this to lowest terms!**)

A _________________ is a comparison of two *different quantities* that are *not similar*. Rates usually deal with speed or money.

Example:

- Dollars per Item ($/item)
- Miles per Hour (mi/hr)
- Items per Minute (items/min)

When you compare two **different items** you will have **the same units with which you started** when you are finished.

*A _______ __________ is *rate per 1 unit* (**denominator = 1**).

This should look familiar…

1. If $\frac{1}{2}$ gallon of paint covers $\frac{1}{6}$ of a wall, then how much paint is needed for the entire wall?	**2.** If a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate.
3. Regina can read $\frac{1}{8}$ of a book in 2.5 days. How long will it take her to read the entire book?	**4.** Penelope can swim $\frac{3}{8}$ of a mile in 7.25 minutes. How long will it take her to swim a mile?
5. A boa constrictor slithers $^{2}/_{6}$ kilometers in $^{4}/_{5}$ hours. What is its speed in terms of kilometers per hour?	**6.** A dog runs $^{5}/_{7}$ kilometers in $^{4}/_{35}$ hours. What is its speed in terms of meters per hour?

For each unit price, tell which one is a better buy:

7. 3 dozen binder clips for $2.88; 72 binder clips for $5.40

8. 14.5 gallons of gasoline for $50.08; 18.6 gallons of gas for $53.17

9. What is the ratio of the *number of dimes in a dollar* to the *number of nickels in a dollar*?

MINI LESSON (combine with Standard 7.RP.1)

SWBAT**:** ____

Standard 7. RP.3 *Use proportional relationships to solve multistep ratio and percent problems.*

10. Sally has a recipe that needs $\frac{3}{4}$ teaspoon of butter for every 2 cups of milk. If Sally increases the amount of milk to 3 cups of milk, how many teaspoons of butter are needed?

11. Elaina has a recipe that needs $\frac{1}{4}$ teaspoon of butter for every 3 cups of milk. If Sally increases the amount of milk to 5 cups of milk, how many teaspoons of butter are needed?

12. A recipe calls for 2 ½ cups of flour to make 2 dozen cookies. How many cups of flour would you need to make 15 dozen cookies?

13. A crew of loggers felled and cleared ½ acre of lumber in four days. How long will it take the same crew to fell and clear 2 ¾ acres of lumber?

Homework. Show all steps

1. A faucet fills a $^5/_7$-liter tub in $^2/_6$ minutes. What is its flow rate in terms of liters per minute?

2. A waste company can process $^5/_6$ kilograms of garbage every $^4/_{30}$ hours. What is their speed in terms of kilograms per minute?

3. Over a period of $3\frac{1}{2}$hours, $211\frac{3}{4}$ leaves fell from a tree. At this rate, how many leaves fell in one hour?

4. Georgia drove a total of 252 miles and used $12\frac{1}{2}$ gallons of gasoline. What is this rate in miles per gallon?

5. Tyler scored 21 goals in 7 soccer games. What was the unit rate?

6. While climbing down a mountain, Anthony descended $45\frac{2}{3}$ feet every $\frac{1}{2}$hour. At this rate, how many feet will he descend in 6 hours?

7. Which is the better buy? 12.5 gallons of gasoline for $45.08; 9.20 gallons of gas for $37.15.

8. A recipe calls for 3 ½ cups of flour to make 4 dozen cookies. How many cups of flour would you need to make 16 dozen cookies?

9. A recipe that serves 8 calls for 15 oz. of cooked tomatoes. How many oz. of cooked tomatoes will be needed if the recipe is reduced to serve 6? How many servings can be made with 20 oz. of cooked tomatoes?

10. A certain soil mixture calls for 8 parts of potting soil to 3 parts of sand. To make the correct mixture, Holly used 0.672 kg of sand and 2 bags of potting soil. How much potting soil was in each bag?

SWBAT: ____

____

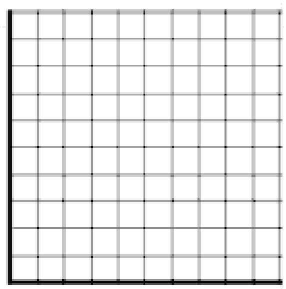
Standard 7. RP.2 *Recognize and represent proportional relationships between quantities.*
a. *Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.*
b. *Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. Represent proportional relationships by equations.*
c. *Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.*

Example: The table below gives the price for different numbers of books. Do the numbers in the table represent a proportional relationship? You can test this by checking for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.

Number of Books	Price
1	3
3	9
4	12
7	18

Equivalent Ratios

Graph



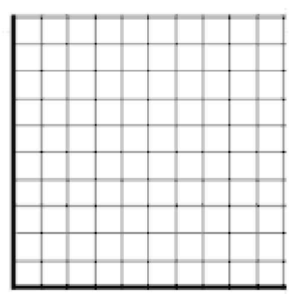
Tell whether the tables below represent a proportional relationship. Use both methods shown above. Explain why they do or do not.

1.

Number of Balls	Price (In Dollars)
1	2
2	4
3	6
4	7

Equivalent ratios

Graph



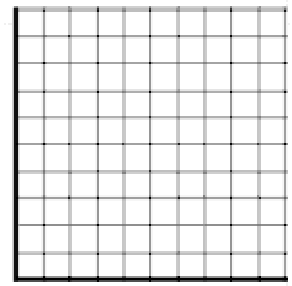
Tell whether the tables below represent a proportional relationship. Use both methods shown above. Explain why they do or do not.

2.

Distance (km)	Time (In Minutes)
4	20
6	30
8	40
10	50

Equivalent ratios

Graph

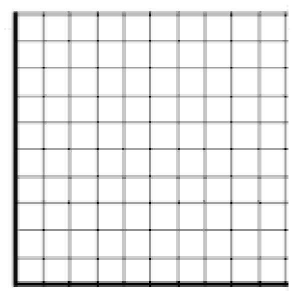


3.

Cupcakes	Time (In Minutes)
5	15
7	21
8	23
9	27

Equivalent ratios

Graph



4. If total cost **c** is proportional to the number **n** of items purchased at a constant price **p**, the relationship between the total cost and the number of items can be expressed as c = pn. Use this theory to test if proportional relationship exists in the following table:

Number of Shirts (n)	Total Cost (c)
2	58
4	116
5	145

The Constant of proportionality is the same as the unit rate.

The constant of proportionality for the problem above is __________________.

The unit rate for the problem above is _____________________.

5. Andrea is a florist. The table below shows the number of flowers sold over the last few days. Use the equation you learned about above to find the constant of proportionality.

Flowers sold	Days
3	6
4	8
5	10
6	12

6. Given an equation in the form $y = kx$, you can identify the constant of proportionality = k. The price of apples at a store can be determined by the equation: $P = \$0.35n$, where P is the price and n is the number of pounds of apples. What is the constant of proportionality (unit rate)?

7. The number of downloads on i-tunes can be determined by the equation D = 250x, where D is the total number of downloads and x is the number of downloads per second. What is the constant of proportionality or unit rate?

Homework: show all work

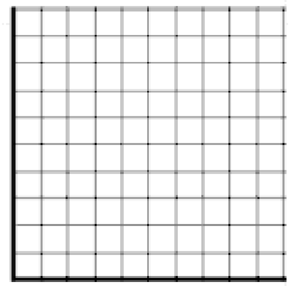
Tell whether the tables below represent a proportional relationship. Use both equivalent ratios and make a graph. Explain why they do or do not.

1.

Number of portraits	Time (In Hours)
1	5
2	10
3	15
4	20

Equivalent ratios

Graph



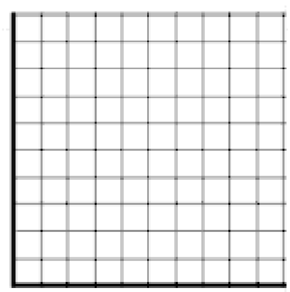
Explain:

2.

Number of Comics	Price (Dollars)
2	6
4	12
6	16
8	24

Equivalent ratios

Graph



Explain:

Homework continued

3. A ferry has to transport bikes on an island. The table below shows the number of bikes transported and the number of trips made by the ferry. Use the equation $y = kx$, *that* you learned about in the lesson to find the constant of proportionality.

Number of bikes	Number of trips
10	5
12	6
14	7
16	8

4. The table below shows the amount earned by Harry for selling cups of ice cream. Use the equation $y = kx$, *that* you learned about in the lesson to find the constant of proportionality.

Cups sold	Earnings ($)
3	12
5	20
7	28
9	36

5. The price of tires at a store can be determined by the equation: P = $74n, where P is the price and n is the number of tires. What is the constant of proportionality (unit rate)?

6. The price of hats at a store can be determined by the equation: P = $7n, where P is the price and n is the number of hats. *You will need to use a separate sheet of graph paper for this problem.*

a. What is the constant of proportionality (unit rate)?

b. Make a table with the number of hats equal to 1, 2, 3, 4 & 5. Complete the table for P, the price of the hats.

c. Make a graph of your table above.

c. Is it possible for there to be a total number of hats that costs $91? Explain your answer.

SWBAT: ____

____

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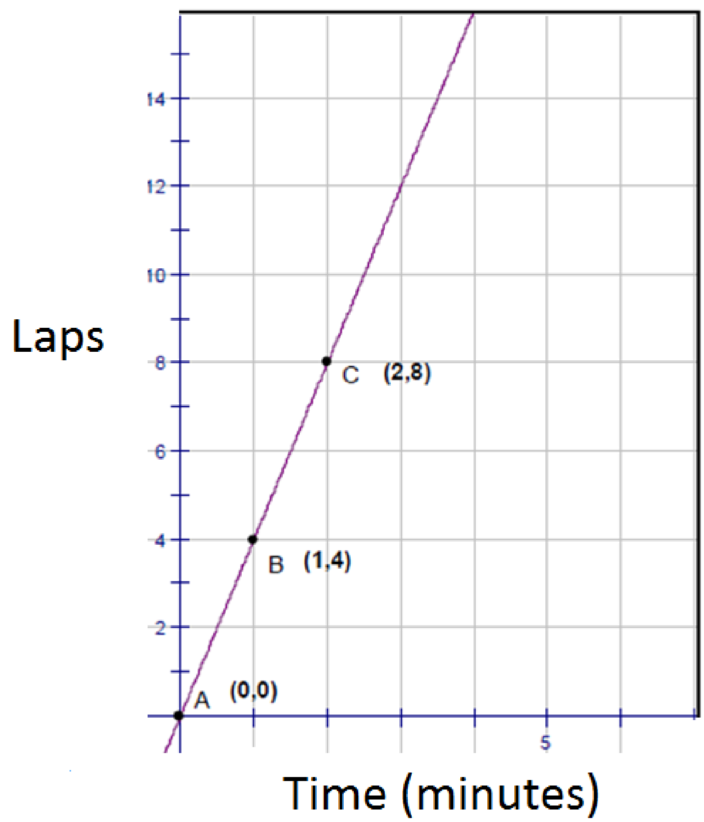
Take a look at the graph below. Look at point B. Susan runs four laps at the track in 1 minute.

1. Explain the meaning of point A (0,0):

2. Explain the meaning of point C (2,8):

3. How many laps does Susan run in 3 minutes?



4. How long does it take Susan to run 6 laps?

5. What is the unit rate for Susan?

Making a table and graph based on a relationship

1. Complete the ratio table below for the following statement, "One out of three students at Learwood Middle School take Spanish."

Spanish	1				
Total	3				

a. What is the unit rate for this relationship?

b. How many students are in school if zero students take spanish?

c. Make a graph for the table. Using a straight edge, draw a line through all the points. Notice that the line goes through point (0,0). What does this mean?

d. What does the ordered pair (5,15) tell us?

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2. Create a ratio table below for the following statement, "Tracy can ride her bike 30 miles in 3 hours."

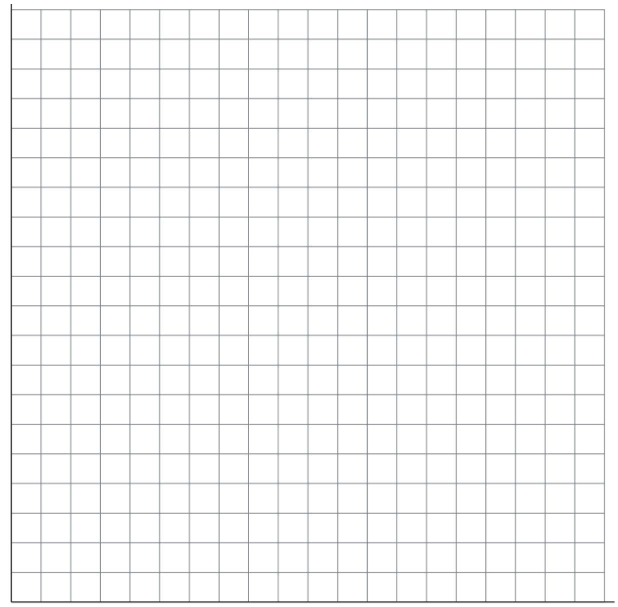
a. What is the unit rate for this relationship?

b. How many miles did she ride after 2 hours?

c. Make a graph for the table. Using a straight edge, draw a line through all the points. Notice that the line goes through point (0,0).

d. What does the ordered pair (5,50) tell us?

3. Create a ratio table below for the following statement, "To make a brownie mix, you need ½ cup of sugar for every package of mix."



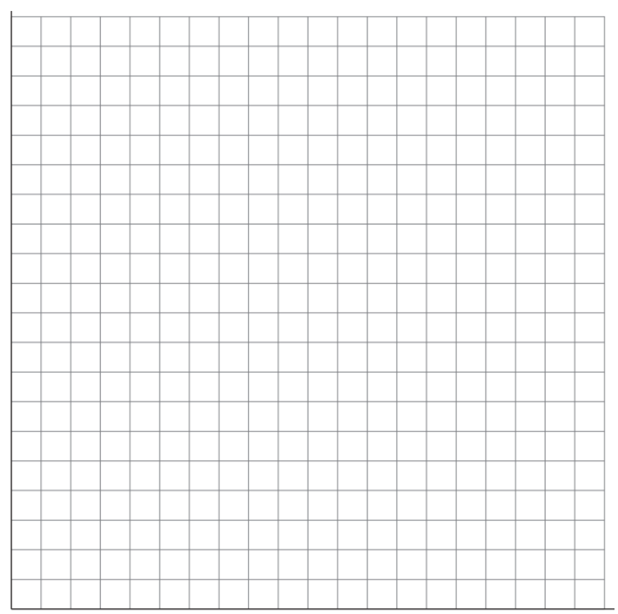
a. What is the unit rate for this relationship?

b. How many cups of sugar do you need for 5 packages of mix?

c. Make a graph for the table. Using a straight edge, draw a line through all the points. Notice that the line goes through point (0,0).

d. What does the ordered pair (4,8) tell us?

4. Create a ratio table below for the following situation. A vine grows 2.5 feet every 3.5 days.



a. What is the unit rate for this relationship?

b. Make a graph for the table. Using a straight edge, draw a line through all the points.

c. How tall is the plant after 10 days?

d. Is the length of the vine on the last day proportional to the number of days of growth?

Homework

1. Complete the ratio table below for the following statement. An adult elephant drinks about 225 liters of water per day.

Time (days)	1				
Water (liters)	225				

a. How many liters of water does the elephant drink in 4 days?

b. Make a graph for the table. Using a straight edge, draw a line through all the points.

c. Does this represent a proportional relationship? If so, what is the unit rate for this relationship?

d. What does the ordered pair (4,900) tell us?

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2. Which situation below represents a **proportional relationship** between the number of laps run by each student and their time? To find out, make a graph of each. Explain which one shows a proportional relationship.

Desmond's Time (s)	146	292	584
Laps	2	4	8

Maria's Time (s)	150	320	580
Laps	2	4	6

3. Plant A is 18 inches tall after 1 week, 36 inches tall after two weeks, and 62 inches tall after three weeks. Plant B is 17 inches tall after two weeks, 25.5 inches tall after three weeks, and 34 inches tall after four weeks. Make a graph to determine which plant represents a proportional relationship between the plants' height and the number of weeks.

Plant A

Plant B

4. The greenhouse temperatures at certain times are shown in the table below. The greenhouse maintains temperatures between 65 degrees F and 85 degrees F. Suppose the temperature increases at a constant rate. Create a graph of the time and temperatures at each hour from 1:00 p.m. to 8:00 p.m. Is the relationship proportional? Explain using complete sentences.

Time	Temperature (°F)
1:00 P.M.	66
6:00 P.M.	78.5
8:00 P.M.	83.5

SWBAT: ____

Standard 8.EE.5

Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.

Comparing two different data displays

We are going to use a fact we know and a new on that we are going to learn now to compare two different data displays.

Fact 1: If data forms a straight line that goes through the origin, then its ______________________.

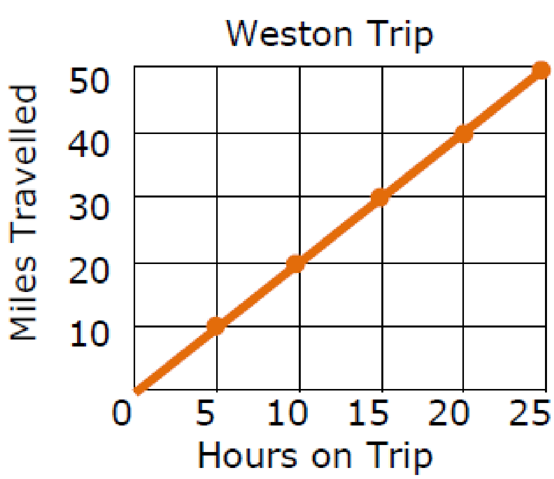
Fact 2: If an equation is written in the form y =mx, then its ________________________.

If they are both proportional, then we can compare them by comparing their…

Constant of proportionality = k = unit rate = m = slope

Example 1

Weston and Jaden go for long bike rides. The graph below represents Weston's trip over the period of 2 months. The equation below represents Jaden's consistent pace. Which rider moves at a faster pace?



Jaden's Pace

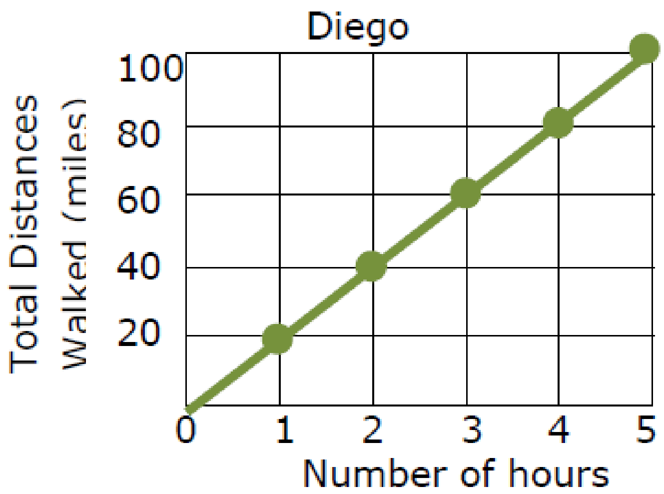
$y = 20x$

x = hours

y is miles

Example 2

The graph below represents the number of miles ran over time by Diego. Kevin ran at a constant pace represented by the equation. Who ran at a faster pace?



Kevin

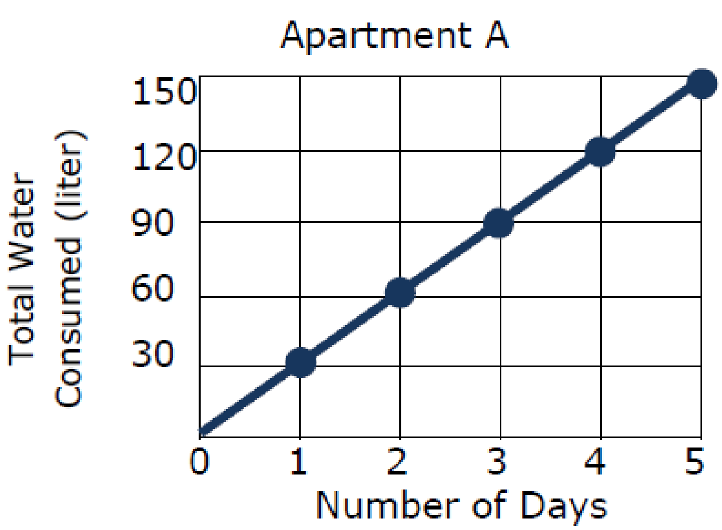
$y = 10x$

y = Distance

x is number of hours

Example 3

Apartment A and B consume lots of water. The graph below represents the water consumed by apartment A. The equation represents the water consumed by apartment B. Which apartment consumed less water on average?



B apartment

$y = 15x$

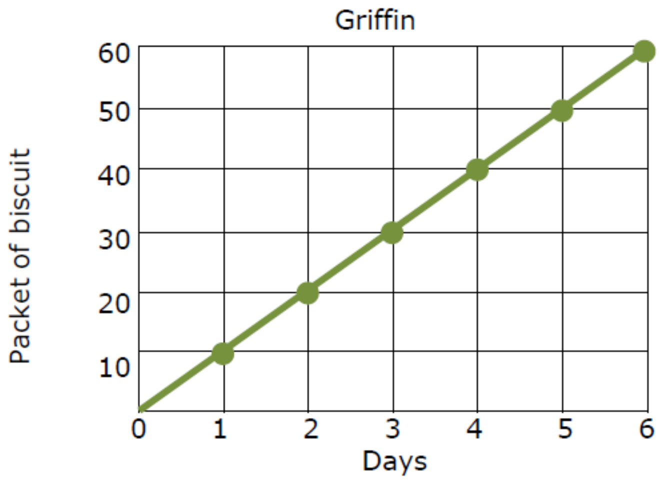
x= No. of days

y is water consumed

Example 4

The graph below represents the number of packs of biscuits that Griffin eats over 7 days. The equation below represents how many packs of biscuits Bradley eats as a constant.

Who eats more biscuits over the course of a week?



Bradley

$y = 5x$

x= No. of days

y is packs of biscuits

Example 5

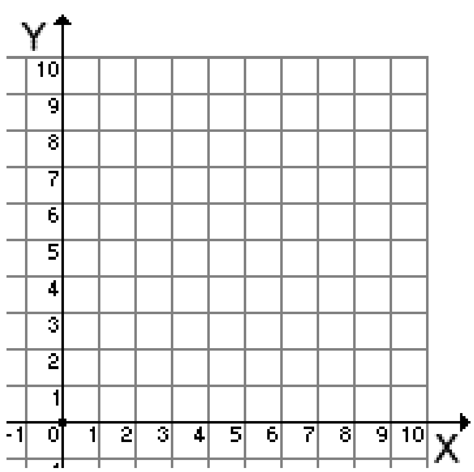
The tables below represent two cars moving at different speeds during a race. Make a graph and write an equation for each table. Which car drove faster and by how many miles per minute?

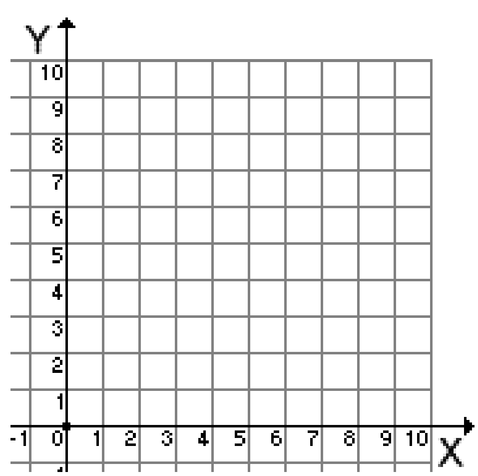
Car A

minutes	miles
2	3.4
3	5.1
4	6.8
5	8.5

Car B

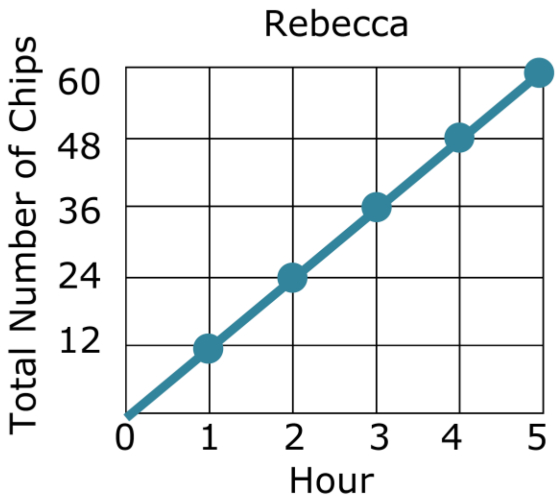
minutes	miles
2	3.8
3	5.7
4	7.6
5	9.5





Homework

1. The graph below represents how many chips Rebecca eats in an hour. The equation represents the rate that Leila eats chips at. Find out who eats more chips in 3 hours.



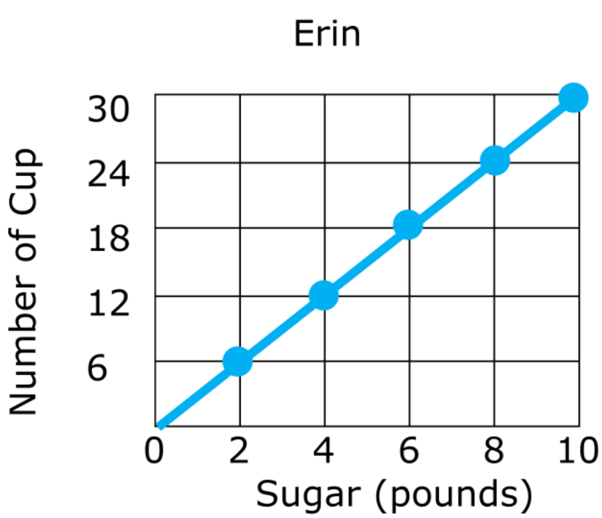
Leila

y = 15x

x = No. of hours

y = Number of Chips

2. Erin and Lucia both have coffee shops. The graph below represents how many cups of tea Erin made and the amount of sugar used. The equation represents how many cups of tea Lucia made and the amount of sugar used. Who uses sugar at a faster rate?



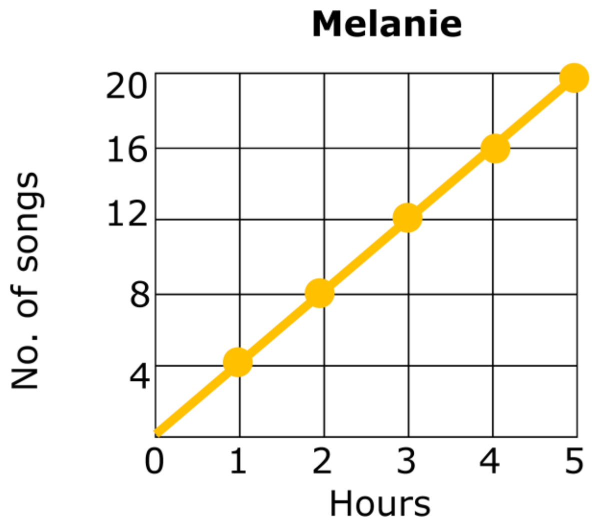
Lucia

y = 10x

x = Sugar (pounds)

y is no. of cup

3. The graph below represents the rate at which Melanie listens to songs. The equation represents the rate at which Jesse listens to songs. Over a day, who listens to more songs?



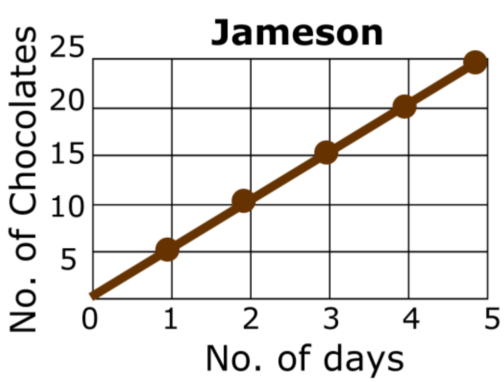
Jesse

y = 2x

x= Hours

y = number of songs

4. The graph displays how many chocolates Jameson eats over the course of 5 days. The equation represents the rate at which Ezra eats chocolates. Find out who eats more chocolates over 5 days.



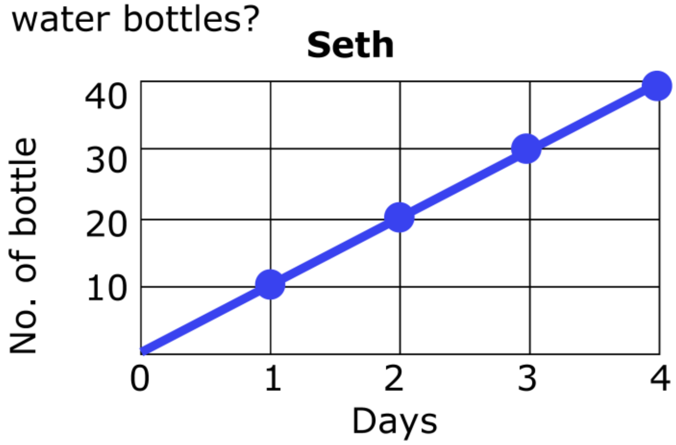
Ezra

y = 4x

x= No. of days

y is No. of chocolates

5. The graph below represents how many water bottles Seth sold. The equation represents the rate at which Hayden sold water bottles. Who sold more water bottles?



Hayden

y = 11x

x= No. of days

y is No. of bottle

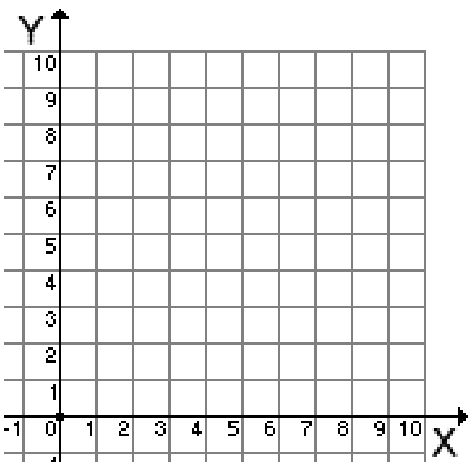
6. **The tables below represent the sales of two lemonade stands. Make a graph and write an equation for each table. Which lemonade stand had larger sales per year and by how much?**

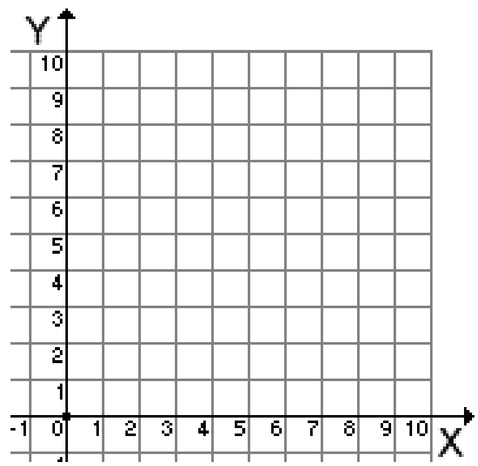
Stand A

year	Hundreds of Dollars
2	1.74
3	2.61
4	3.48
5	4.35

Stand B

year	Hundreds of Dollars
6	4.44
7	5.18
8	5.92
9	6.66





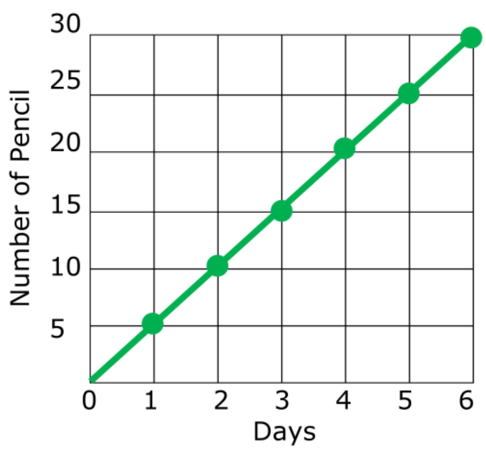
<u>Similar Triangles, Slopes & Equations of Lines</u>

SWBAT: ____

Standard 8.EE.6

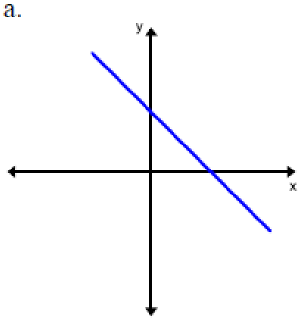
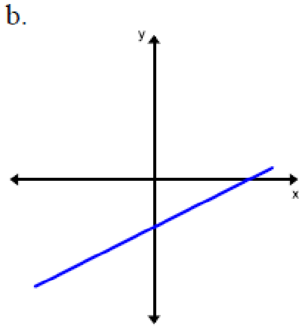
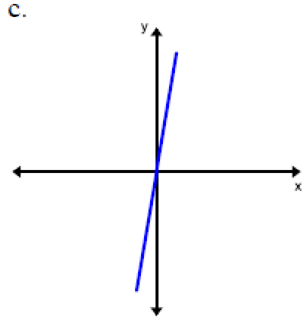
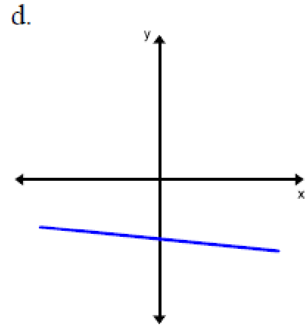
Use similar triangles to explain why the slope *m* is the same between any two distinct points on a non-vertical line in the coordinate plane. Derive the equation y = mx for a line through the origin and y = mx+b for a line intercepting the vertical axis at b.

In the past we have written equations of lines based on the slope. For example…



So far, we have always had a positive unit rate. That's about to change. Since the line doesn't have to go through the origin, it can be slanted either way and be labeled positive or negative.

1. Do the graphs below have positive or negative slopes? How do you know?

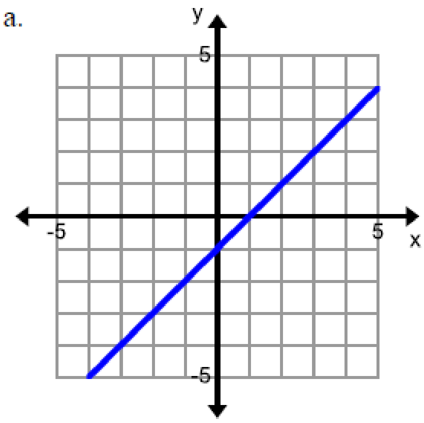
a. 	b. 	c. 	d. 
Positive or negative?			

Now we are going to consider graphs of relationships that are ***NOT*** proportional. These graphs are still straight lines but they ***DO NOT*** go through the origin**. Some examples are shown below.**

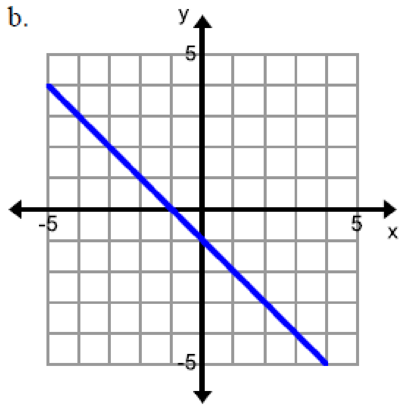
Find the equation of each line in SLOPE INTERCEPT FORM.

$$y = mx + b$$

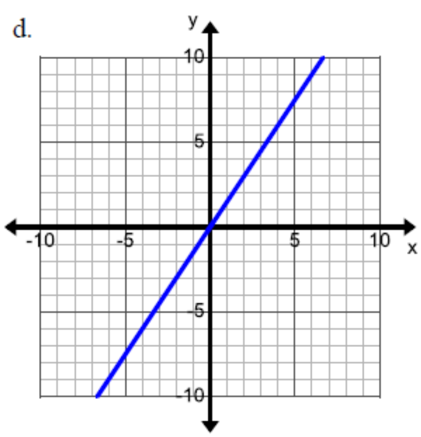
a.



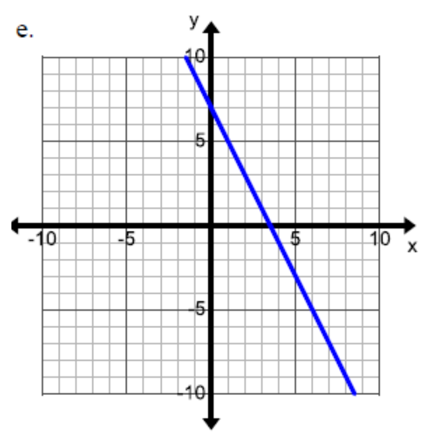
b.



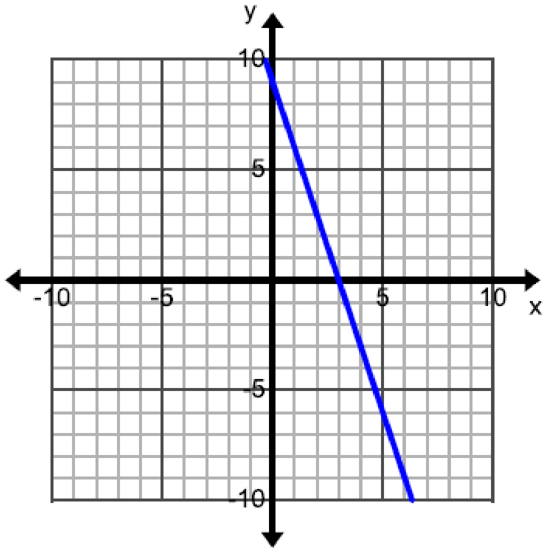
d.



e.

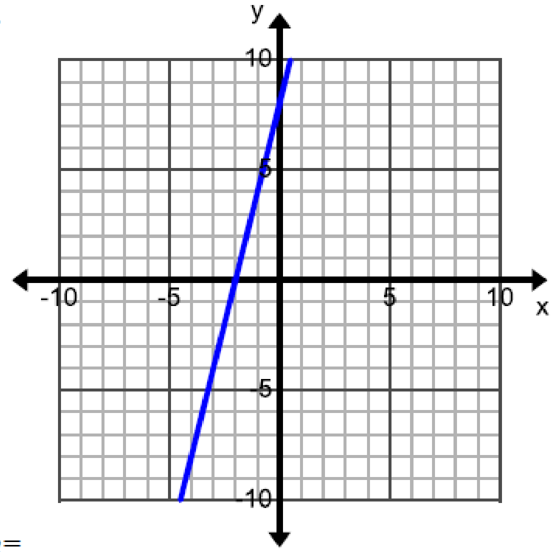


5.



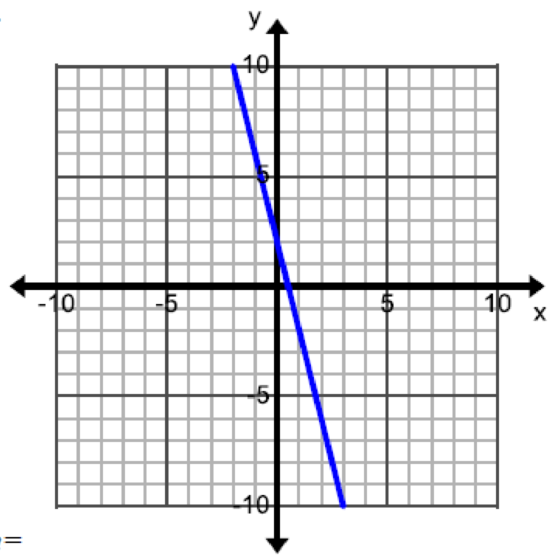
m=

6.



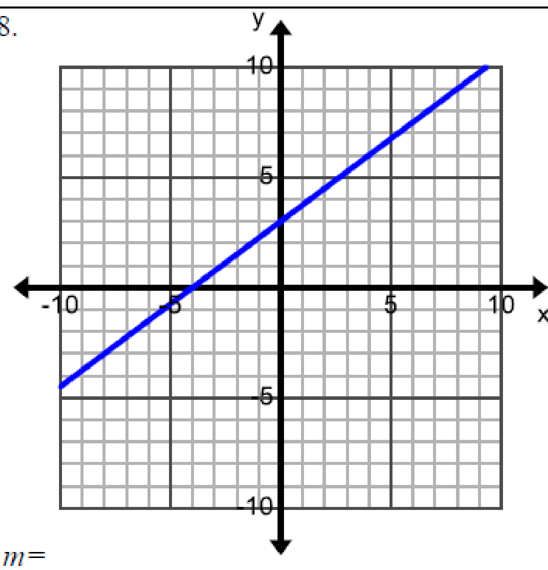
m=

7.



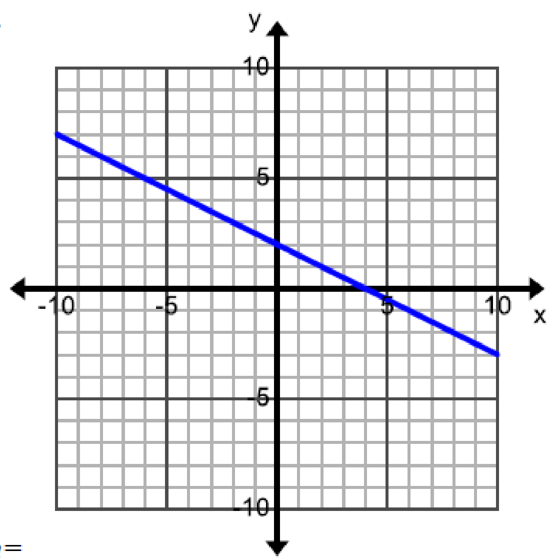
m=

8.



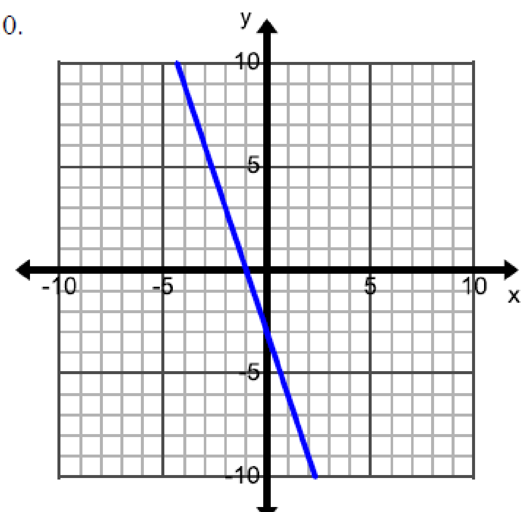
m=

9.



m=

10.

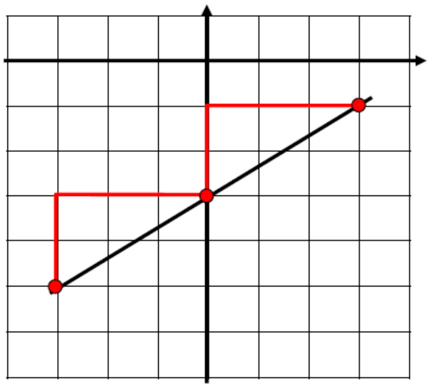


m=

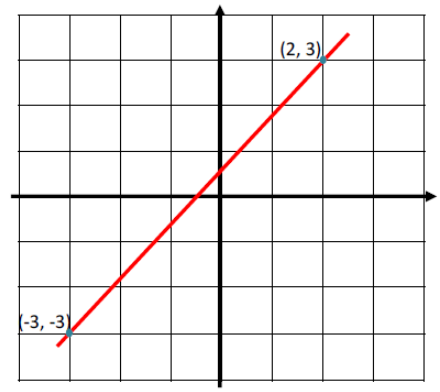
Homework

1. a. Find the slope of the line using the similar triangles as a guide.

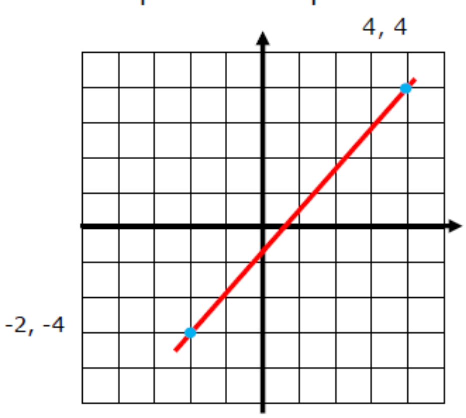
   b. Write the equation of the line.



2. Write an equation to represent this graph:

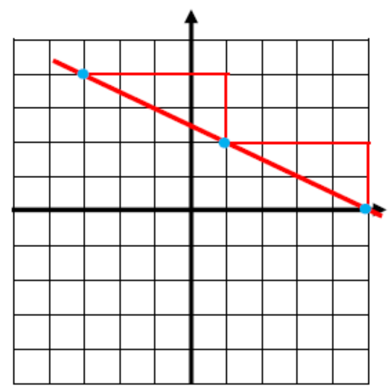


3. Write an equation to represent this graph:



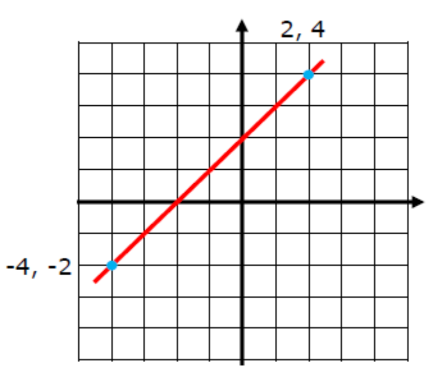
4. a. Find the slope of the line using the similar triangles as a guide.

   b. Write the equation of the line.

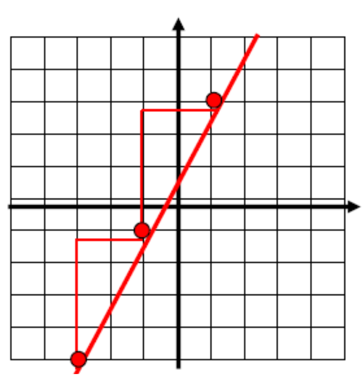


Write an equation to represent each graph in exercises 5 –10.

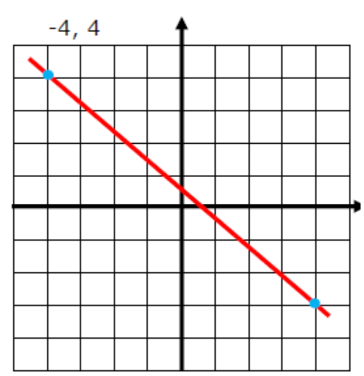
5.



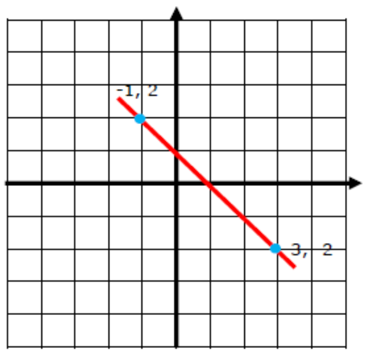
6.

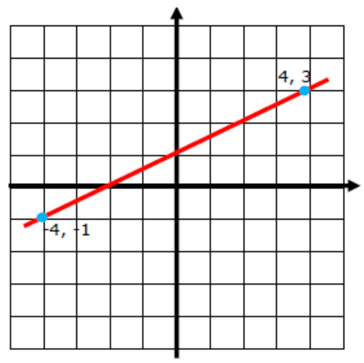


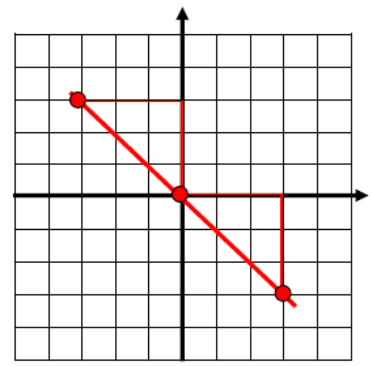
7.



8. **9.** **10.**

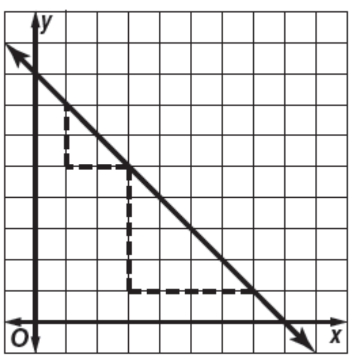






11. The slope of a line is –3.5. What is the simplified ratio of the vertical side length to the horizontal side length of each triangle formed? Explain your answer.

12. Which of the following statements is NOT true concerning the graph below?



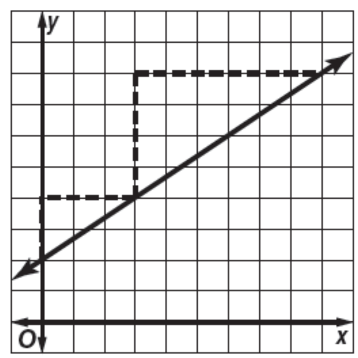
A The simplified ratio of the vertical side length to the horizontal side length of each triangle is 1.

B The slope of the line is 1.

C The slope of the line is -1.

D The smaller triangle and the larger triangle shown are similar.

13. Which statement is TRUE concerning the slope of the line below?



F It is equivalent to the simplified ratio of the vertical side length to the horizontal side length of each triangle shown.

G It is equivalent to $\frac{3}{2}$.

H It is equivalent to the simplified ratio of the horizontal side length to the vertical side length of each triangle shown.

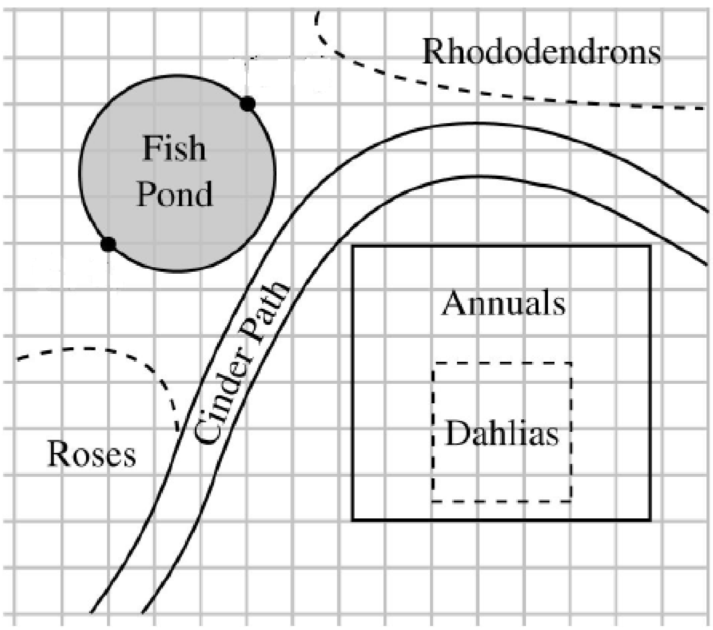
J It is equivalent to $-\frac{2}{3}$.

SWBAT: ____

Standard 7. G.1

Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

Scale Drawings



$$\frac{1}{4} inch = 3\ feet$$

Scale drawings are used to represent actual things in real life. In the example to the left, a landscape architect planned out a garden on paper before any work in the yard was done. This gives the architect a plan to use when the actual yard is worked on.

The scale of a drawing is the ratio of the drawing length to the actual length in real life.

The scale for the garden drawing is written below it. Each small square on the grid = ¼ of an inch.

Use the scale drawing of the garden above to answer the following questions.

1) What are the approximate dimensions of the *actual* yard?

2) About how wide is the *actual* path?

3) Approximately how far is it across the *actual* fish pond?

You can also use a scale factor to find missing measurements in real life. Try the problems below. Remember to always put the drawing dimension on the top and the actual dimension on the bottom.

Hint → $\frac{\boldsymbol{drawing}}{\boldsymbol{actual}}$

Example 1

On a scale drawing, a house is 12 in long. The actual house is 50 ft long. On the drawing, the window is 2.5 inches tall. How many feet tall is the actual window?

Example 2

A drawing of a skyscraper is 11.2 inches high. The scale factor is 8 inches = 250 feet. What is the actual height of the skyscraper?

Example 3

A Florida map has a scale of 1 inch = 22.8 miles. If the actual distance between Vero Beach and Boynton Beach is 79.8 miles, what is the distance on the map between the 2 cities?

Example 4
Blueprints of a house are drawn to the scale of ¼ in = 1 ft. Its kitchen measures 3.5 inches by 5 inches on the blueprints. What are the actual dimensions of the kitchen?

Example 5
On a scale drawing of a white shark, the scale is 2 in = 15 ft. If the actual shark is 38 ½ feet long. How long is the drawing of the shark?

Example 6
Dexter makes a scale drawing of his room. In real life, the actual room is 10' wide and 12' 6" long. In Dexter's drawing, the room is 4" wide. What measure should the length be on the drawing?

Homework

1. A scale drawing has a scale of 1 in. = 10 ft. How long is a line on the drawing that represents an actual length of 22.5 feet?

2. On a map, the distance between Charleston and Mt. Pleasant is 3.2 cm. What is the actual distance between the two towns if the scale of the map is 1 in. = 15 mi?

3. The actual distance between Atlanta and Nashville is 250 miles. What is the distance between the two cities on a map with a scale of 1 in. = 20 mi?

4. Blueprints of a house are drawn to the scale of ¼ in. = 1 ft. A bedroom measures 4 in. by 5 in. on the blueprint. What are the actual dimensions of the bedroom?

5. A scale drawing of the Space Needle in Seattle, Washington has a scale of 1:110. The height of the Space Needle is 605 feet. Find the height of the drawing.

6. On a map, the distance between two cities is 4 ½ inches. What is the actual distance in miles between the two cities if the map's scale is 1 in. = 80 mi?

7. You are making a scale drawing of a football stadium. The drawing has a scale of 12 in. = 480 ft. The actual length of the football field including the end zones is 120 yards.

   a. How long in inches is the football field on the drawing?

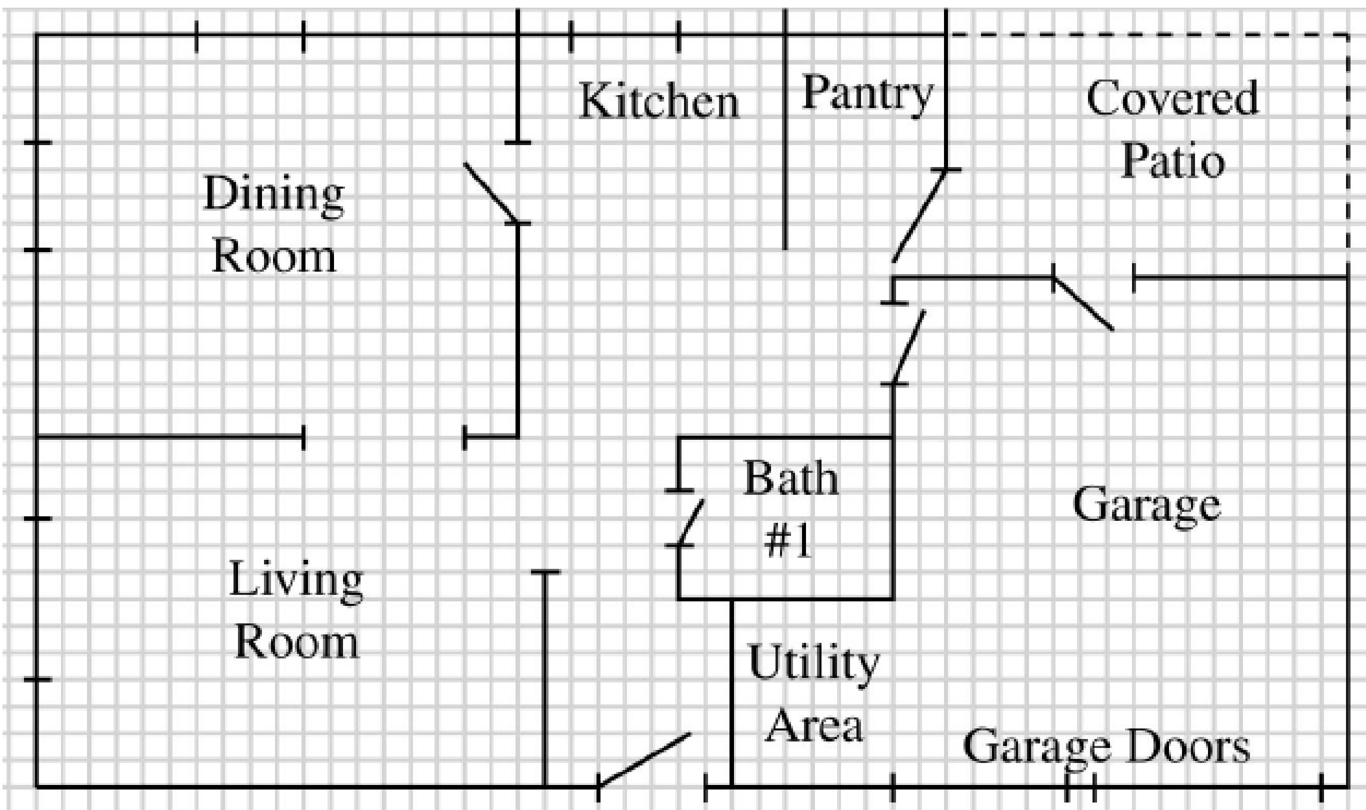
   b. How many times larger is the actual stadium compared to the drawing?

   c. The length of the drawing is 18 inches. How long in yards is the actual stadium?

8. A building is drawn with a scale of 1 in. = 3ft. The height of the drawing is 1 ft 2 in. After a design change, the scale is modified to be 1 in. = 4 ft. What is the height of the new drawing?

More with Scale Drawings

Mrs. Housebuilder wants to have a new house built. She used graph paper to sketch some thoughts for a possible floor plan for her house. The bold outline in the figure below represents the outline of the first floor of the house. The scale of the drawing is ¼ in. = ½ ft. Each of the small squares is ¼ inch.

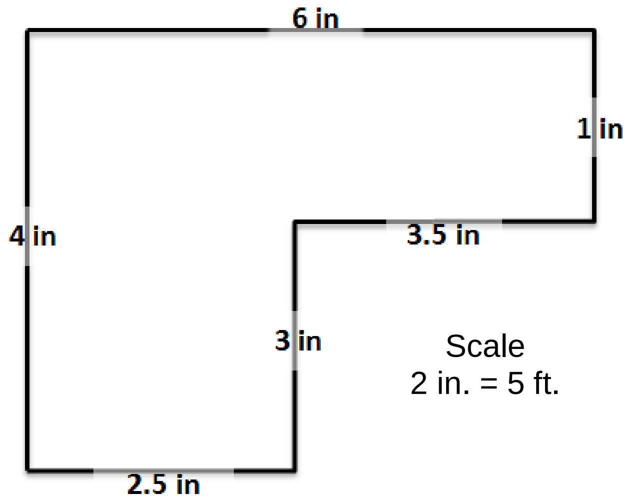


1. What is the perimeter of the room labeled Bath #1 on the drawing?

2. What is the perimeter of the actual bathroom?

3. What is the area of the living room on the drawing?

4. What is the area of the actual living room?



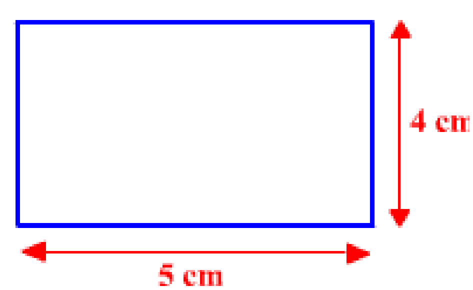
Britney made a scale drawing of her bedroom. The scale is marked below the drawing.

5. What is the length of the actual wall that measures 4 inches on the drawing?

6. What is the length of the actual wall that measures 2.5 inches on the drawing?

7. A square has a perimeter of 60 ft. A scale drawing of the figure is made with a scale of 1/3 in. = 5 ft. What is the perimeter of the scale drawing of the square?

8. The rectangle to the right is enlarged using a scale factor of 1.5.



a) What is the new perimeter of the rectangle?

b) What is the new area of the rectangle?

c) Draw the new rectangle below using a ruler.

9. Blueprints of a house are drawn to the scale of ¼ in. = 1 ft. A bedroom measures 4 in. by 5 in. on the drawing. What is the actual area of the bedroom?

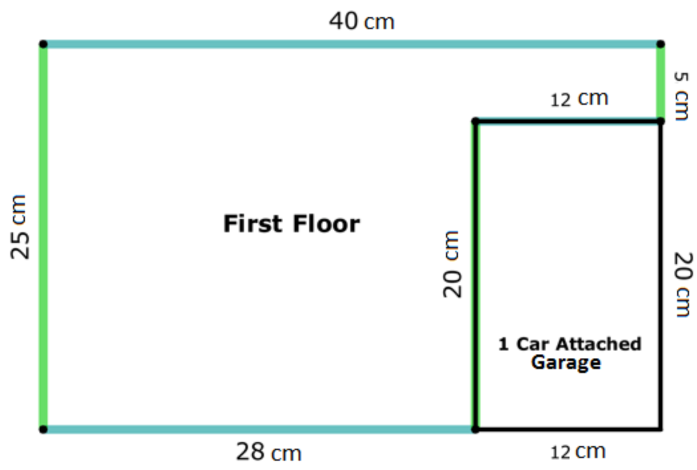
10. A scale drawing of a square with an area of 144 ft^2 is made using a scale of ½ in. = 3 ft.

a) What is the area of the square on the scale drawing?

b) Use a ruler to make the scale drawing of the square below.

Homework

Use the scale drawing of the house below for questions 1 – 4. The scale is 4 cm. = 2 ½ ft.



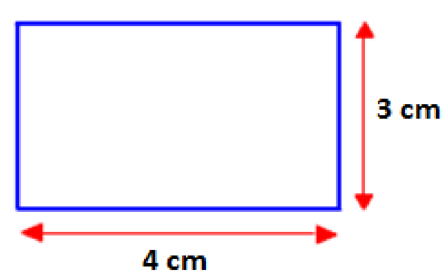
1. What is the length of the actual wall of the house that measures 40 cm?

2. What is the length of the actual wall of the house that measures 25 cm?

3. The area of the 1 Car Attached Garage is 12 cm. by 20 cm. on the drawing. What is the area of the actual garage?

4. You can find the perimeter of the house by adding up all of the sides around it. What is the perimeter of the house in the drawing? What is the perimeter of the actual house?

5. The rectangle to the right is enlarged using a scale factor of 1.25



   a) What is the new perimeter of the rectangle?

   b) What is the new area of the rectangle?

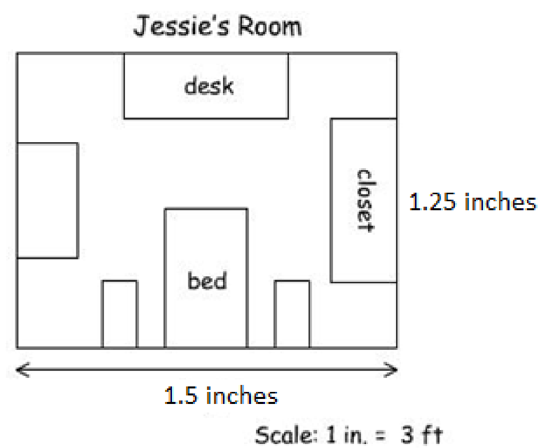
   c) Draw the new rectangle below using a ruler.

6. The area of a rectangle is 216 ft^2. The length of the rectangle is 18 ft. If a scale drawing of the rectangle has a scale of ½ in. = 6 ft., what is the area of the rectangle in the scale drawing?

7. Mariko has a scale drawing of the floor plan of her house. The scale is ½ in. = 3 ft. On the floor plan, the dimensions of her rectangular living room are 1 7/8 inches by 2 ½ inches. What is the area of her real living room in square feet?

8. The drawing below is of Jessie's bedroom.

If each 1 in on the scale drawing equals 3 ft., what are the actual dimensions of Jessie's room?



SWBAT: ____

Standard 7. RP.3

Use proportional relationships to solve multistep ratio and percent problems.

Ratios and multistep problems

Example 1

Avon Lake School District would like to implement a 1:1 technology program in its schools.

1. As part of the district, Learwood has chosen to meet its requirement by providing iPads to all its students. The current ratio of iPads to students is 2:5. The school currently has 220 iPads. How many students attend Learwood?

2. Eastview has also chosen to meet its requirement by providing iPads to all its students. The current ratio of iPads to students is 9:10. The school has 810 iPads. How many more iPads do they need to buy to meet their goal of a 1:1 program?

3. The ratio of boys to girls at the party is 5:6. Four more girls than boys attended. How many boys were at the party?

4. The ratio of the weight of Ann’s dog to Chris’ dog is 4:7. If Chris’ dog weighs 15 pounds more than Ann’s dog, how much does each dog weigh? Use a proportion to solve.

5. Alexis is making punch for the school dance. She mixes 3 parts fruit mix with 5 parts lemon-lime soda. She uses 24 more cups of lemon-lime soda than fruit mix. How much total punch is she making? Use a proportion to solve.

6. A certain math test has 75 questions. The first 15 are true/false and the rest are matching. What is the ratio of true-false questions to matching questions? What is the ratio of matching questions to total questions?

Homework—Solve using a proportion & use a separate sheet of paper to show all work

1. Amanda cut a piece of ribbon into two pieces. The two lengths are in a ratio of 3:5. If the long piece is 34 centimeters longer than the short piece, how long was the original piece of ribbon?

2. The ratio of boys to girls at the dance is 7:9. Each student paid $5 for a ticket at the door. $30 more was collected from the girls than the boys. How many total students were at the dance?

3. For every 5 push-ups that Oscar does, Noah does 7. Noah did 10 more pushups than Oscar did. How many push-ups did each boy do?

4. Maria ran 5 laps for every 3 laps that Sarah ran at cross-country practice. If Maria ran 10 more laps than Sarah by the end of practice, how many laps did she run?

5. An English book is comprised of two sections, literature and grammar, in a ratio of 3:2. How much of each type of content will be needed to make a book of 150 pages?

6. A certain computer lab has 125 computers. 25 are PC's and the rest are Mac's. What is the ratio of Mac's to PC's? What is the ratio of Mac's to total computers?